



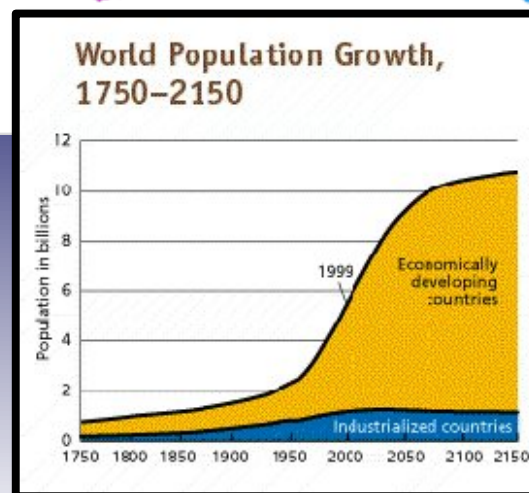
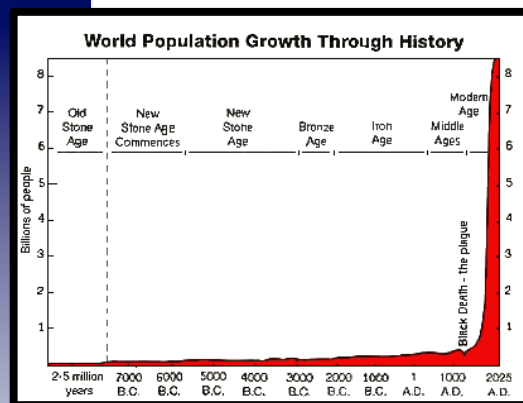
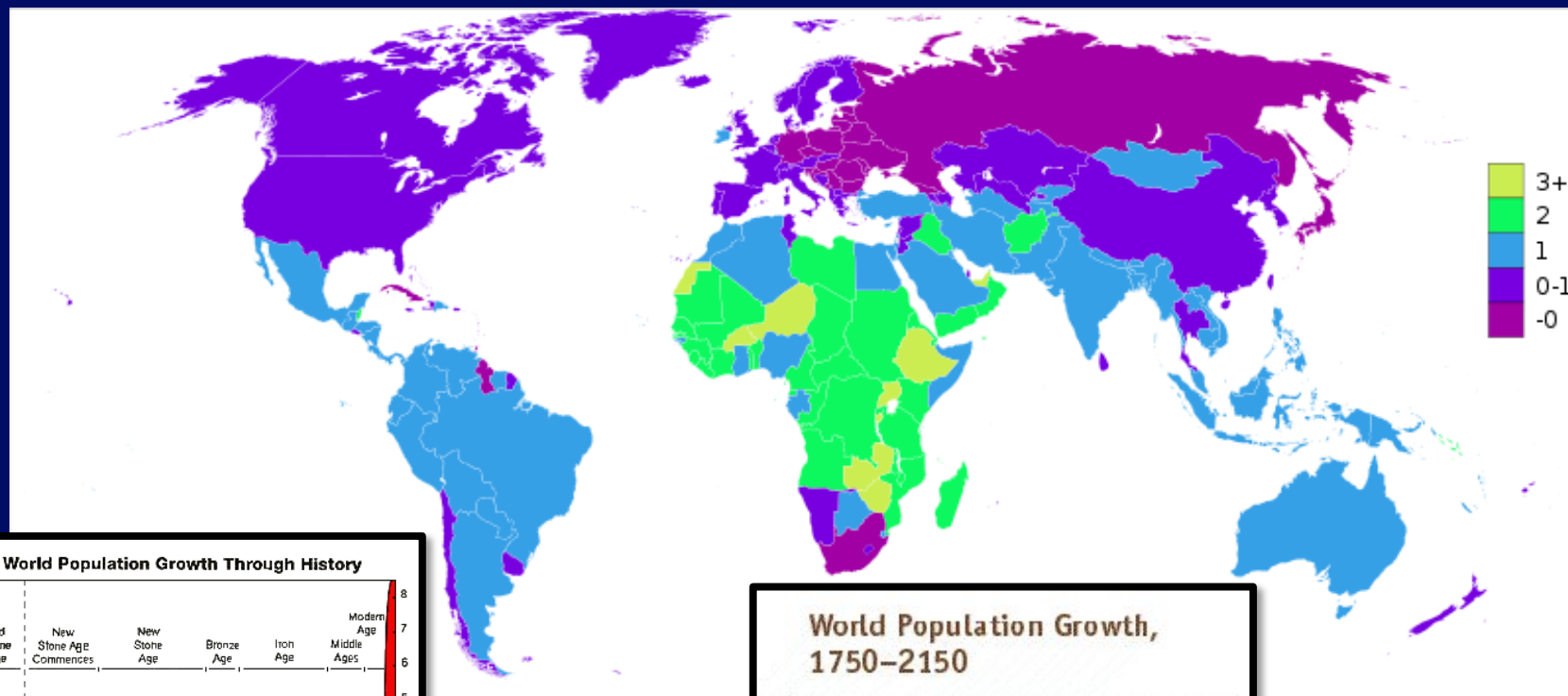
Storms on the Horizon: Science, Technology, and the National Security Challenge

Terry C Wallace
Principal Associate Director
Global Security
October 23, 2012

The Next 20 years



World Population Growth



Energy **IS** National Security



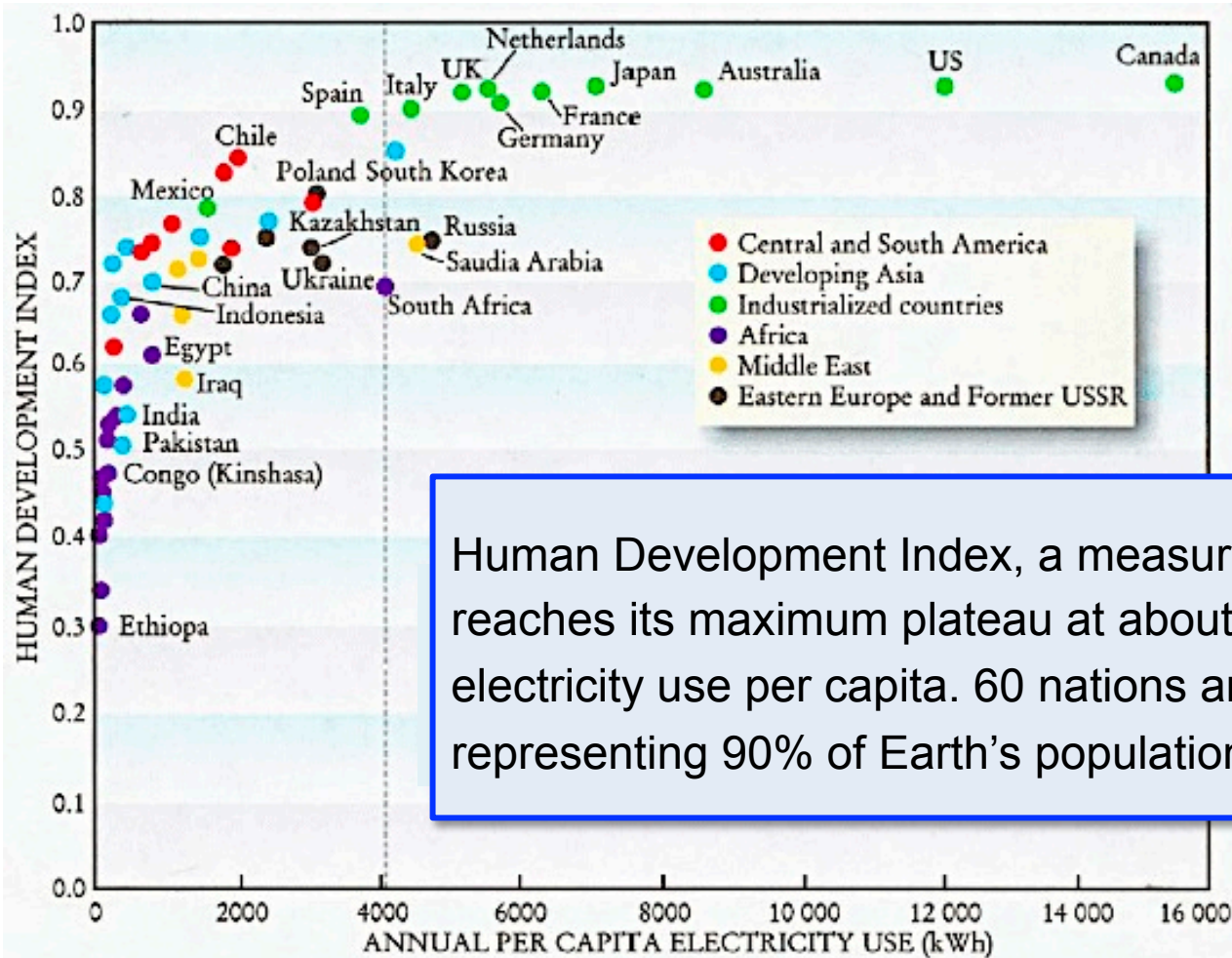
Demand

Economy

Impact

Human Development Index vs per capita electricity use

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Slide 5

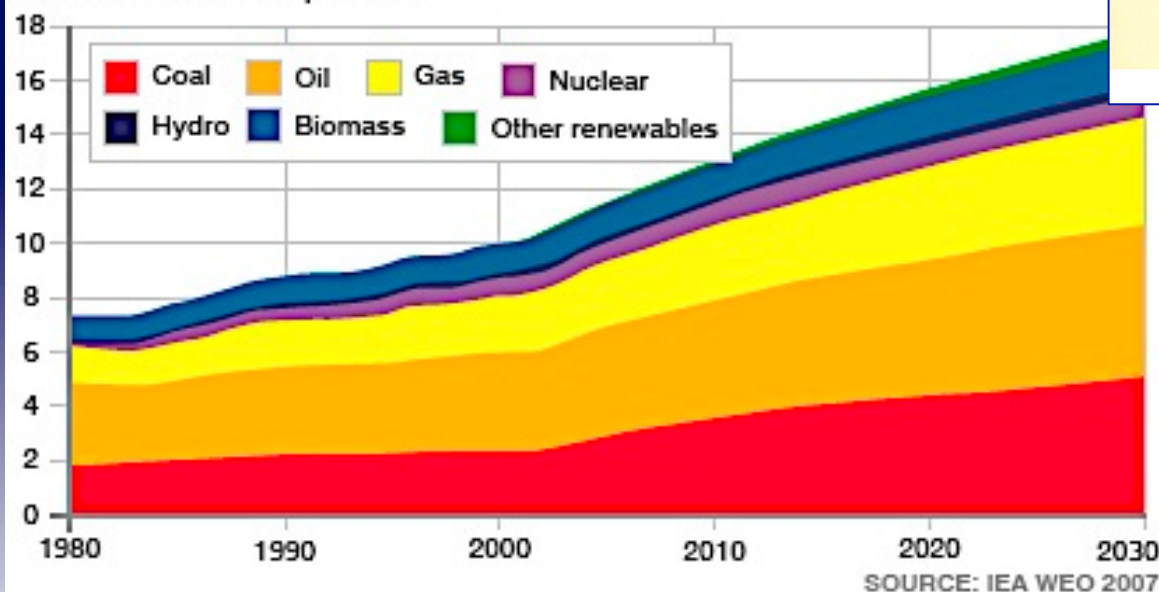


Human Development Index, a measure of human well-being, reaches its maximum plateau at about 4000 kWh of annual electricity use per capita. 60 nations are plotted here, representing 90% of Earth's population.

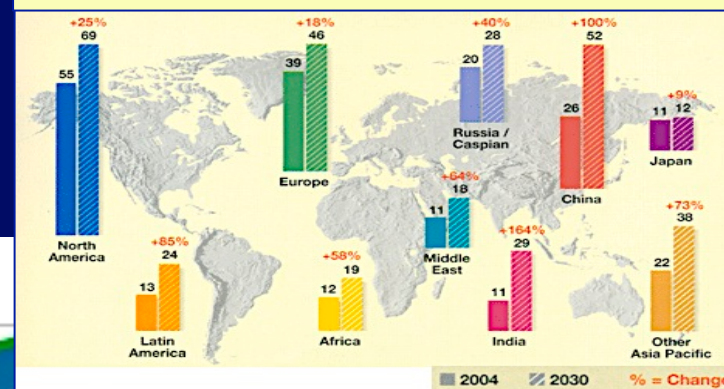
Appetite for energy

PROJECTED GROWTH IN GLOBAL ENERGY DEMAND

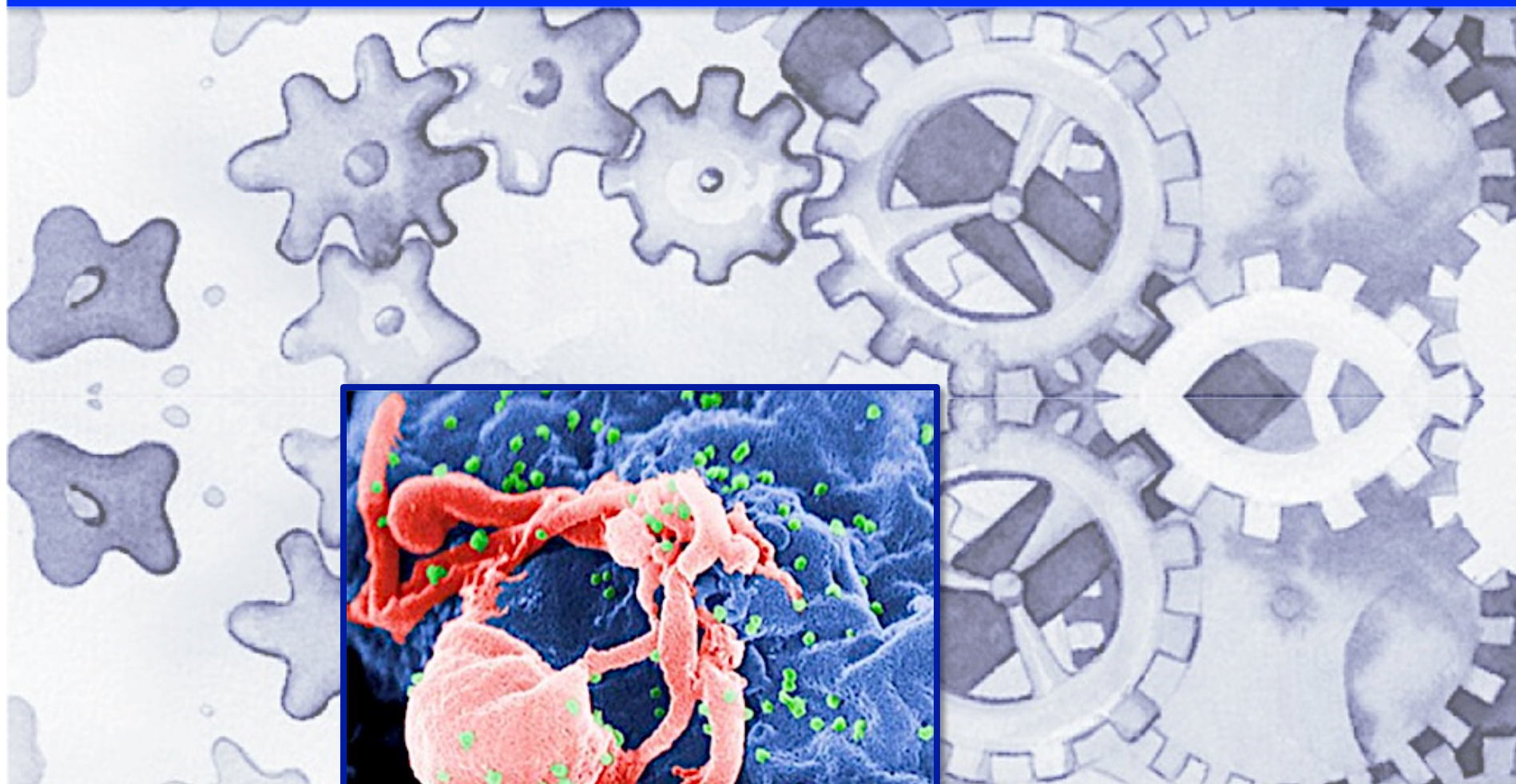
Billion tonnes of oil equivalent



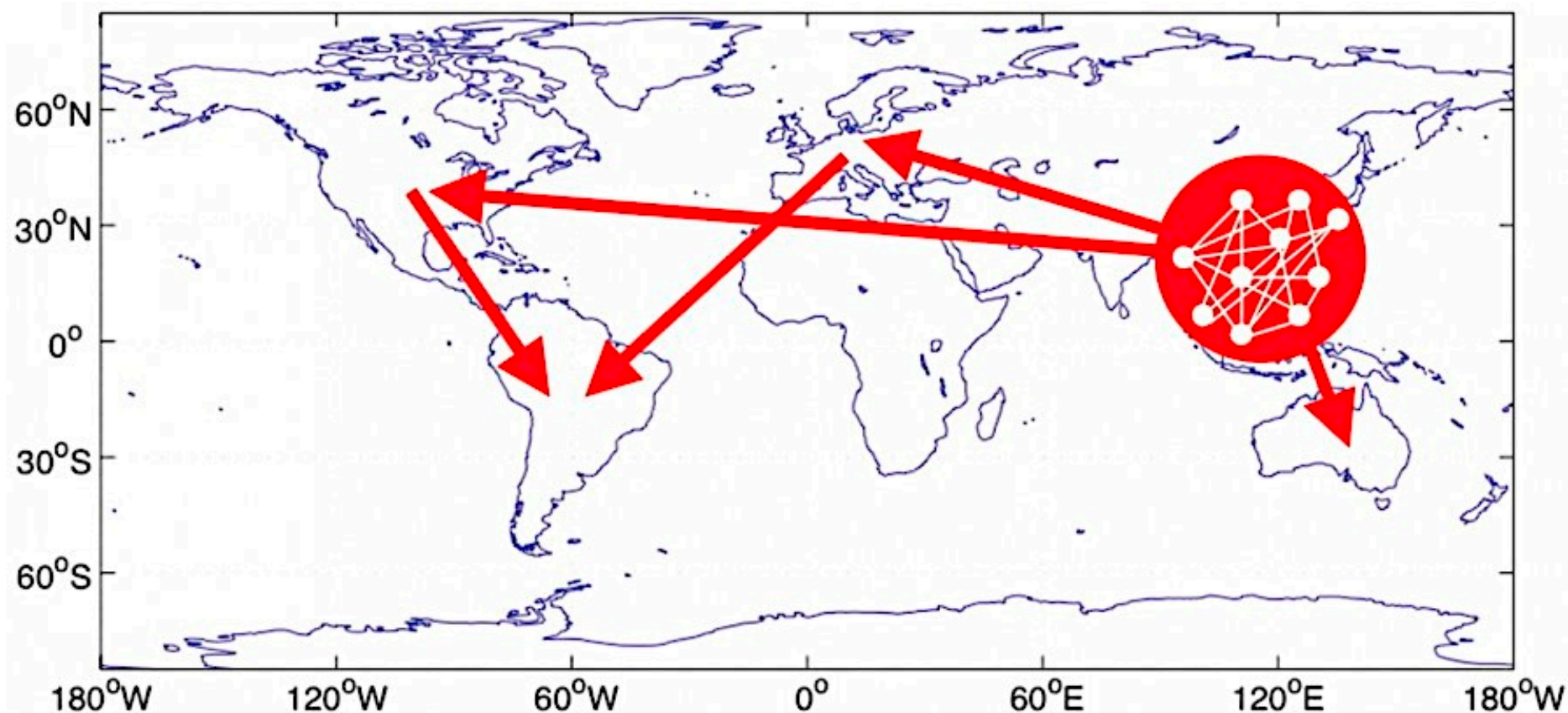
Growing world energy demand (millions of barrels of oil per day)



Health: Pandemic, Warfare, Longevity



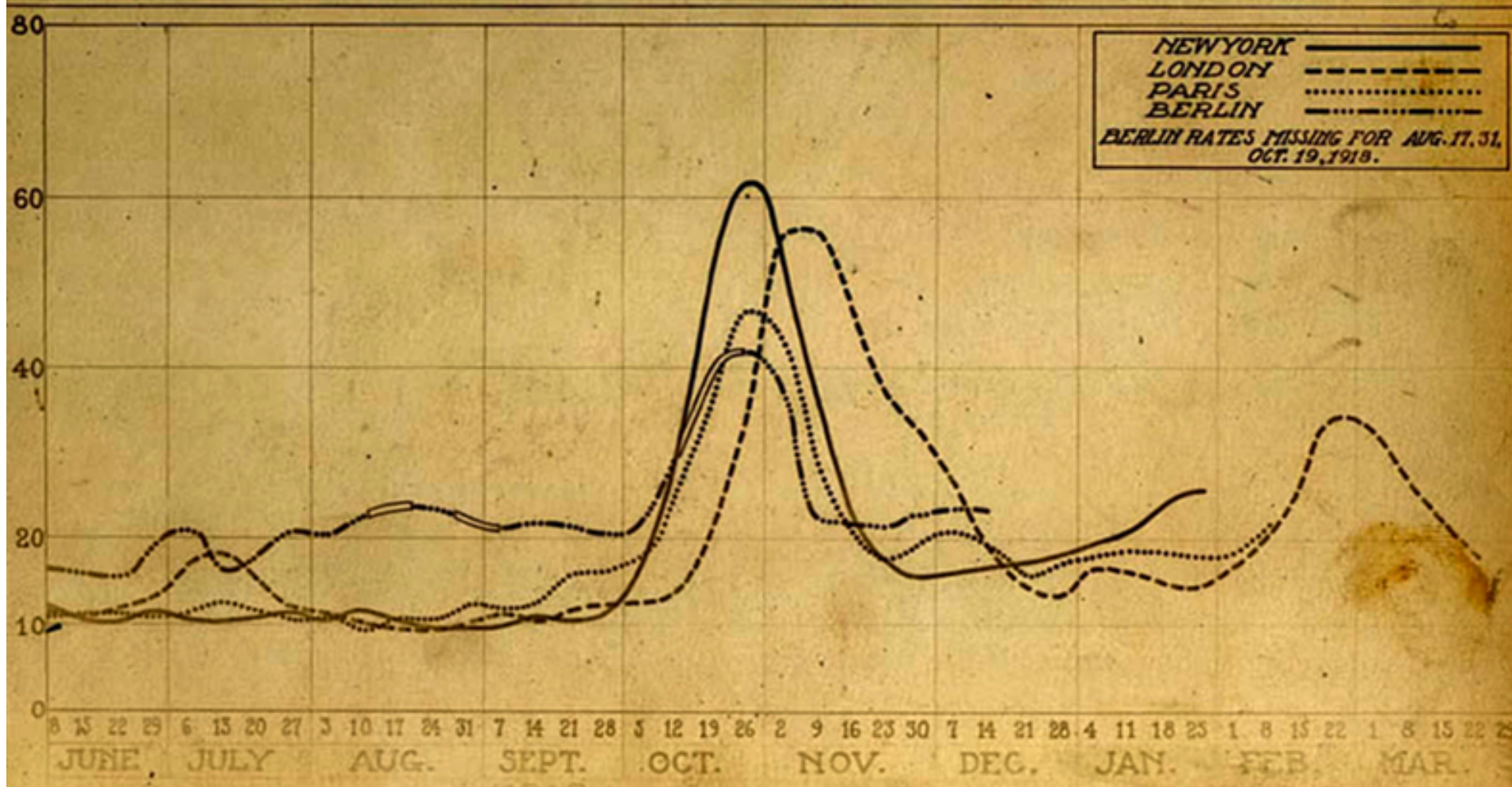
All Flu is from Asia



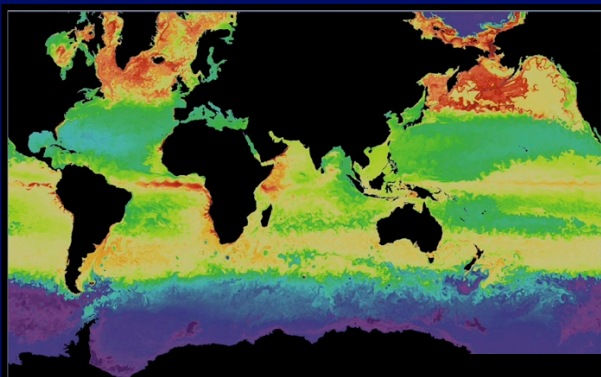
INFLUENZA PANDEMIC

MORTALITY IN AMERICA AND EUROPE DURING 1918 AND 1919

DEATHS FROM ALL CAUSES EACH WEEK
EXPRESSED AS AN ANNUAL RATE PER 1000



A Changing Planet



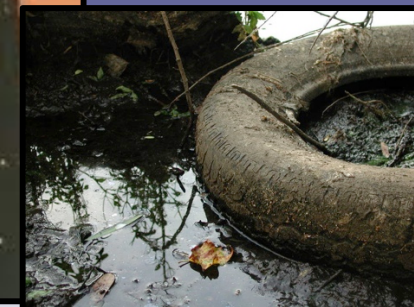
climate change



environmental insult



price of indium



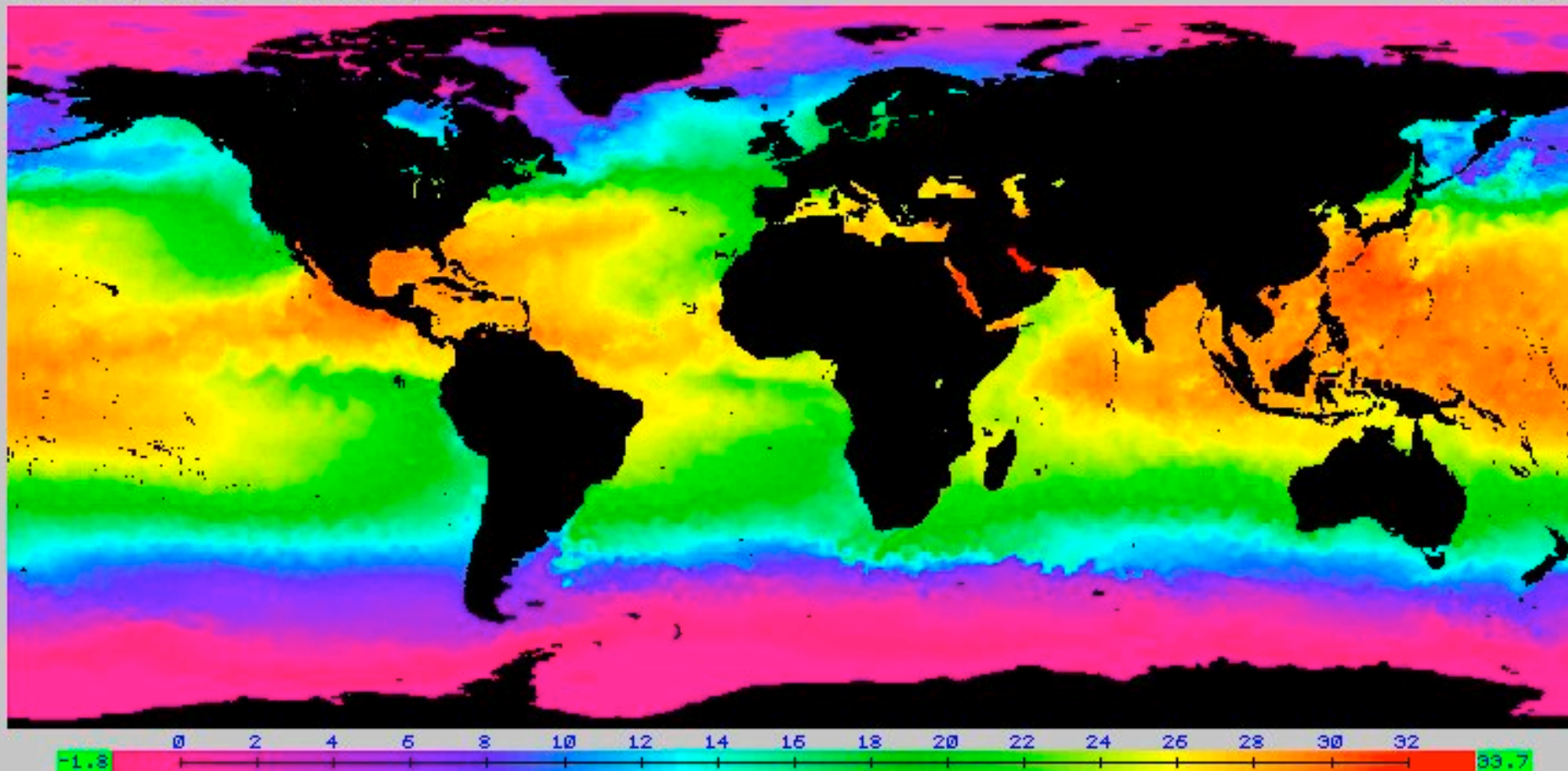
Climate Change & National Security

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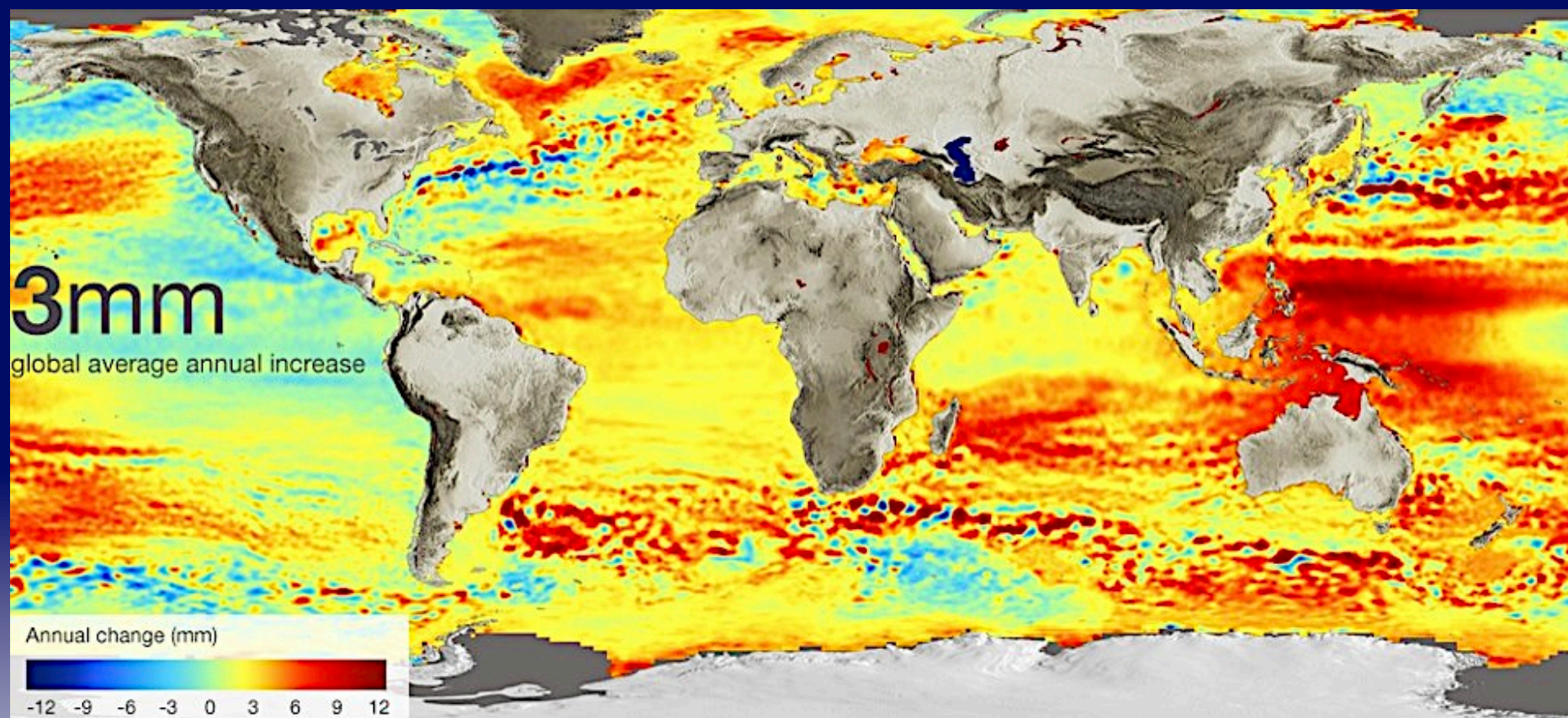
NOAA/NESDIS EDGE IMAGE DISPLAY

SST
50KM GLOBAL ANALYSIS / NOAA-16 OPERATION DAY/NITE
08/06/01 2300 - 08/11/01 0000

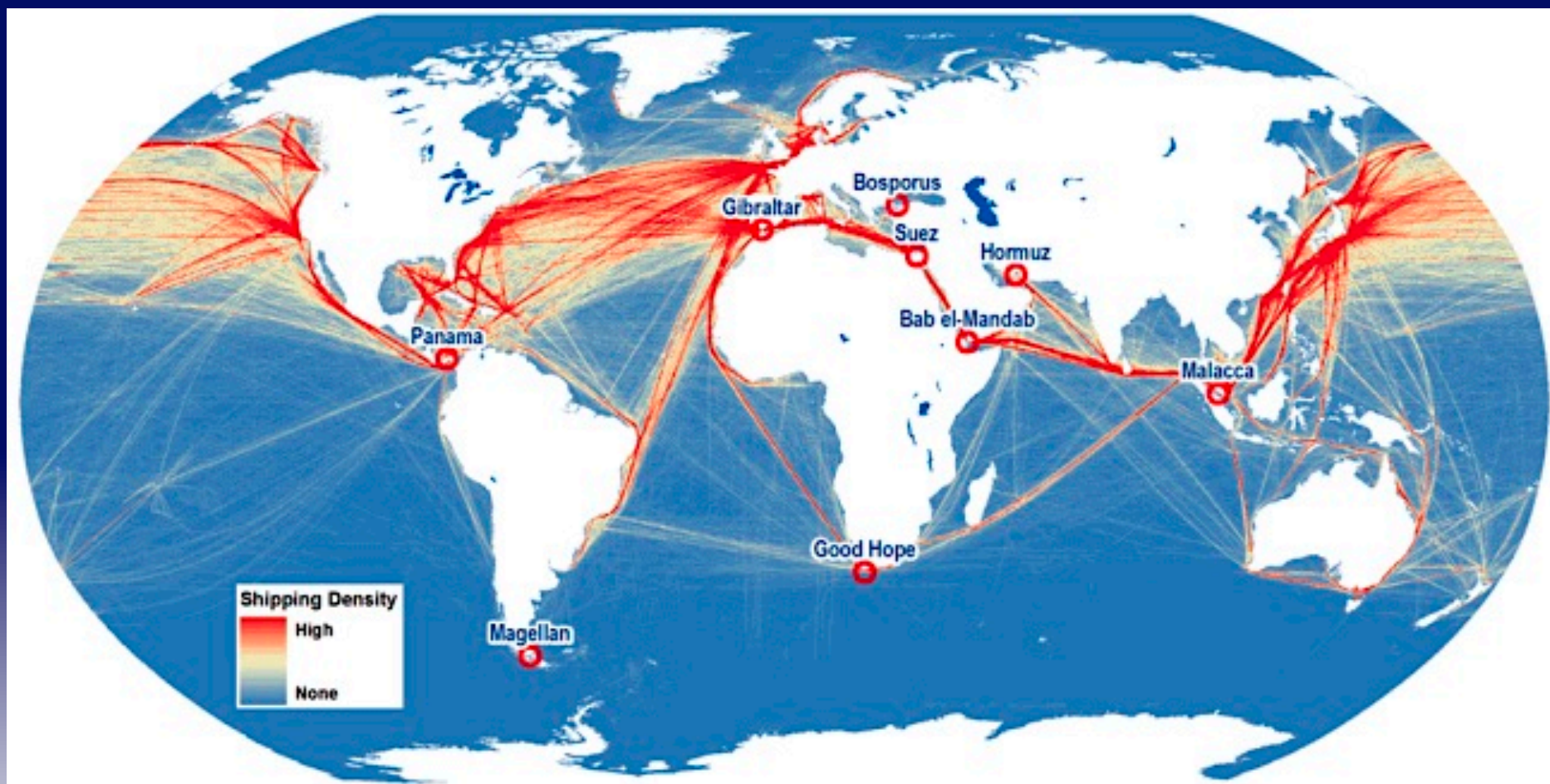
-80.85 LAT
-180.179 LON
97 HOURS



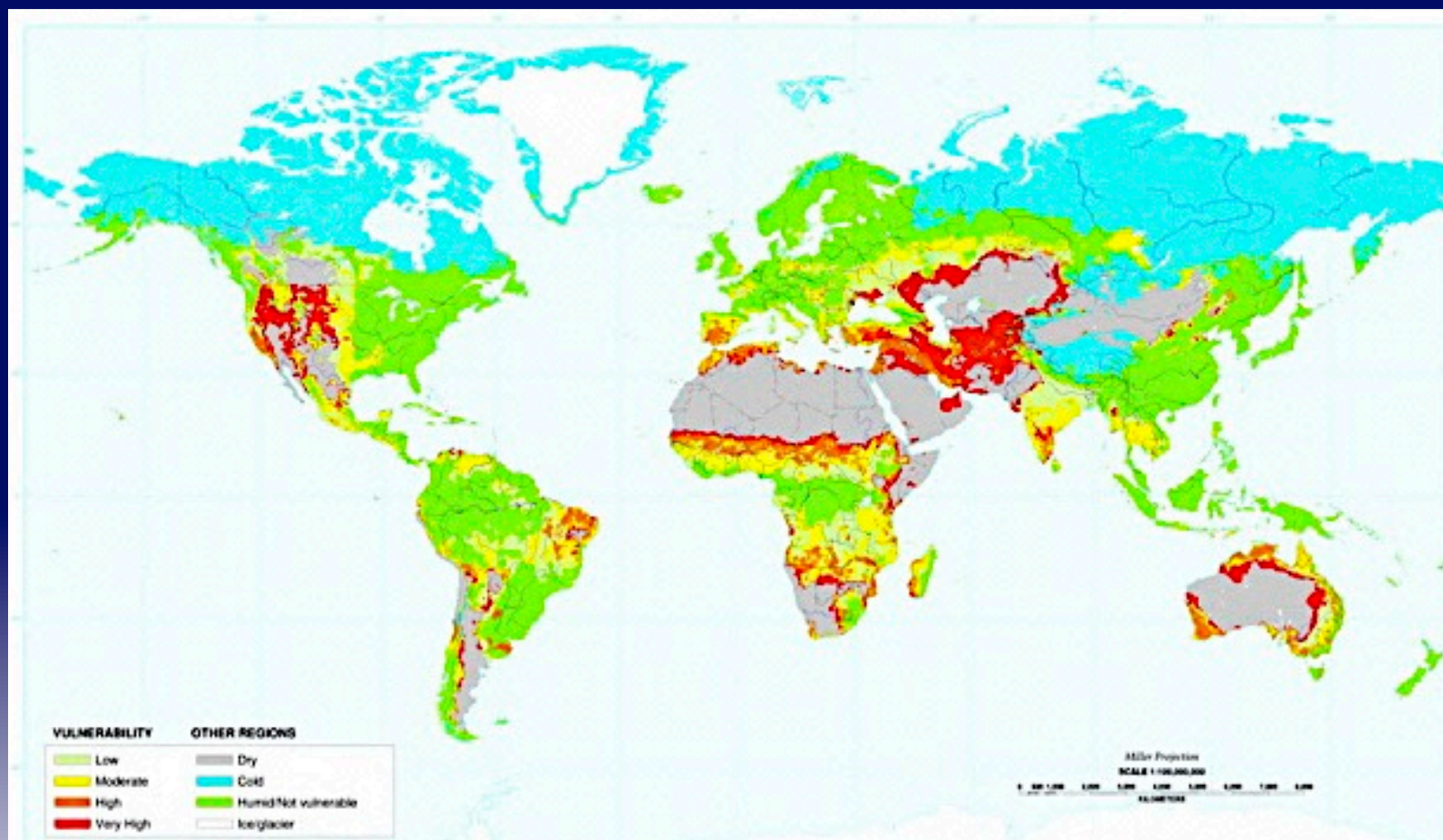
Annual average sea-level rise (1993-2010)



Ocean routes for commerce



Vulnerability to desertification

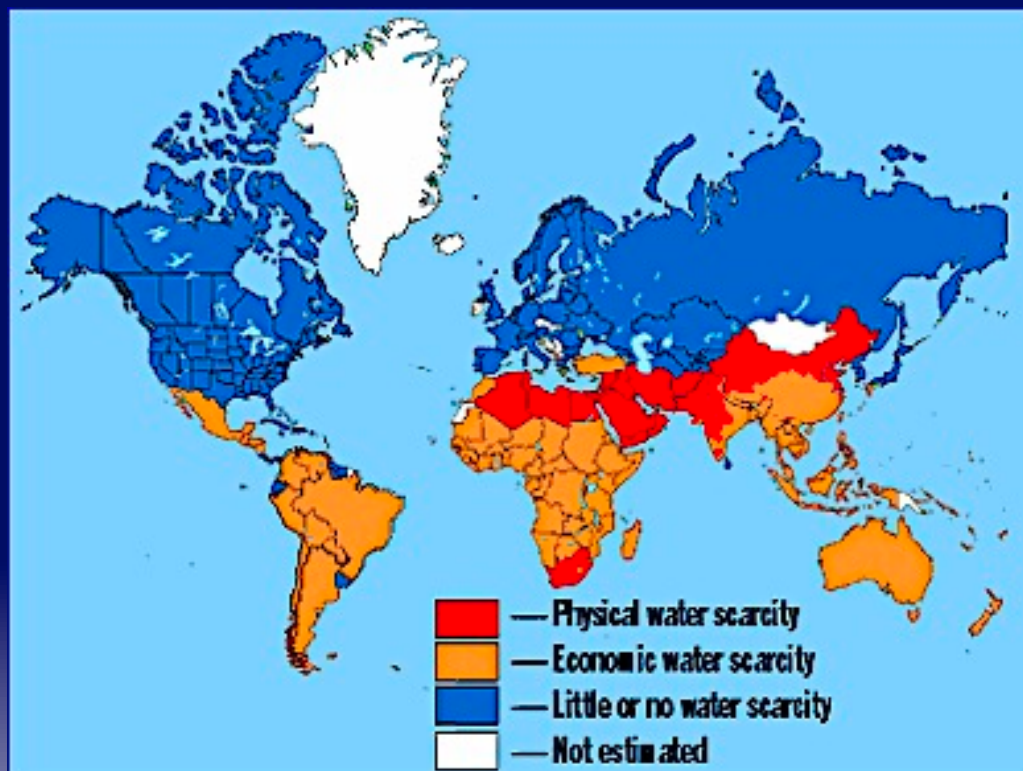


Resources: No more new stuff?

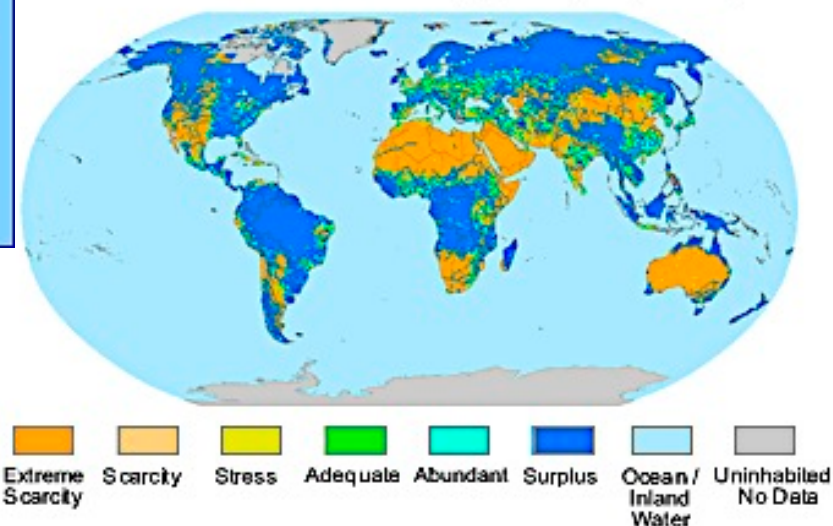


U.S. Department of Energy's NNSA

Global Supplies of Freshwater



Annual Renewable Freshwater Supply Per Capita (ca. 2000)



Warfare of the future is all about asymmetry



HACKED

[In the name of GOD]
This Site Hacked By Iranian DataCoders
Security Team

[Power is with IRAN]

[r00t Was Here]

[We are]

The Washington Post Politics Opinions Local Sports National World Business Tech

National Security

Iran blamed for cyberattacks on U.S. banks and companies



J. Scott Applewhite/AP - Sen. Joseph I. Lieberman, I-Conn., joined by Sen. Jay Rockefeller, D-W.V., right, and Sen. Tom Carper, D-Del., left, speak on cyberattacks on July 24, 2012. Assaults this week on the Web sites of JPMorgan Chase and Bank of America were likely carried out by Iran, Sen. Joseph I. Lieberman (I-Conn.), chairman of the Homeland Security Committee, said Friday.



Sep 20, 2012

NBC: Iran reportedly behind cyber attacks on U.S. banks

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By Michael Winter, USA TODAY

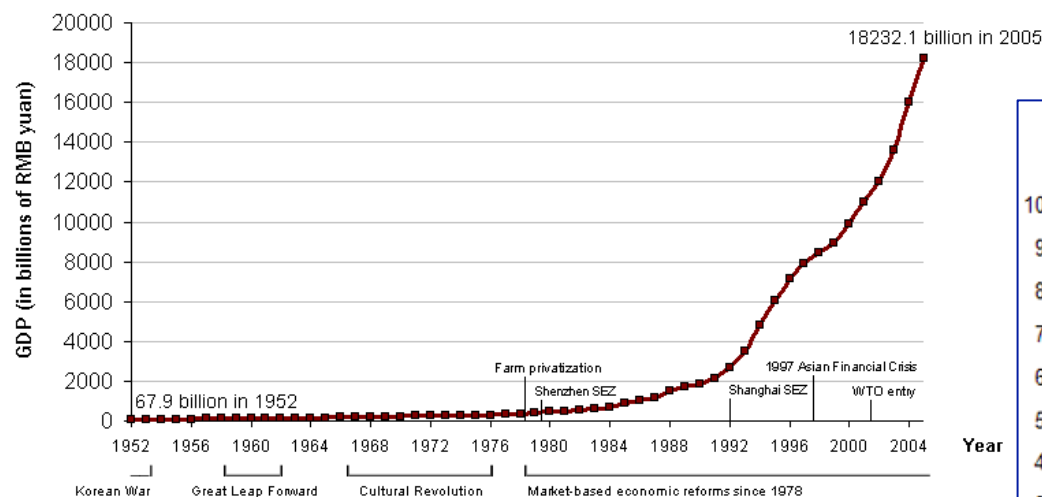
Updated 2012-09-20 8:37 PM

The Iranian government is behind cyber attacks this week that have targeted the websites of JPMorgan Chase and Bank of America, [NBC News is reporting](#), citing national security officials.

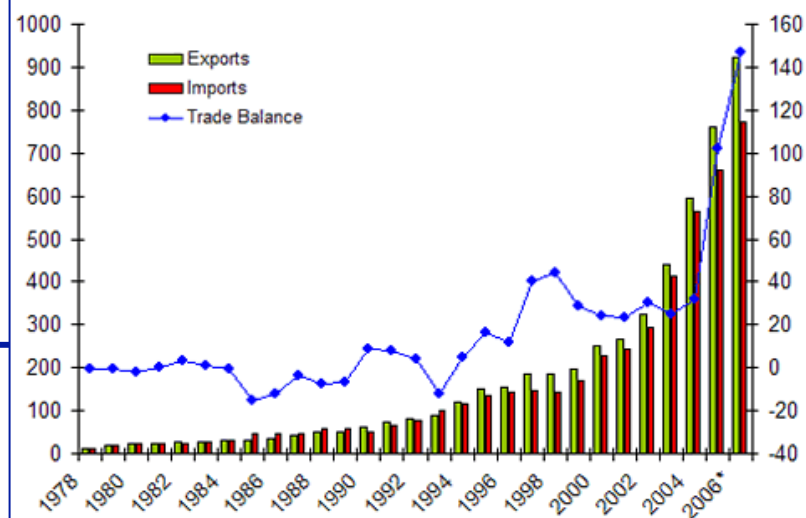
Paradigm shift in China



People's Republic of China's Nominal Gross Domestic Product (GDP) Between 1952 to 2005



China Trade (\$ billions)



Data: National Bureau of Statistics of China

* estimate based on actual data up to Q3

Elements of the East Asian Model in China

State-Owned Enterprises



SOEs are concentrated in strategic industries with intermediate technology



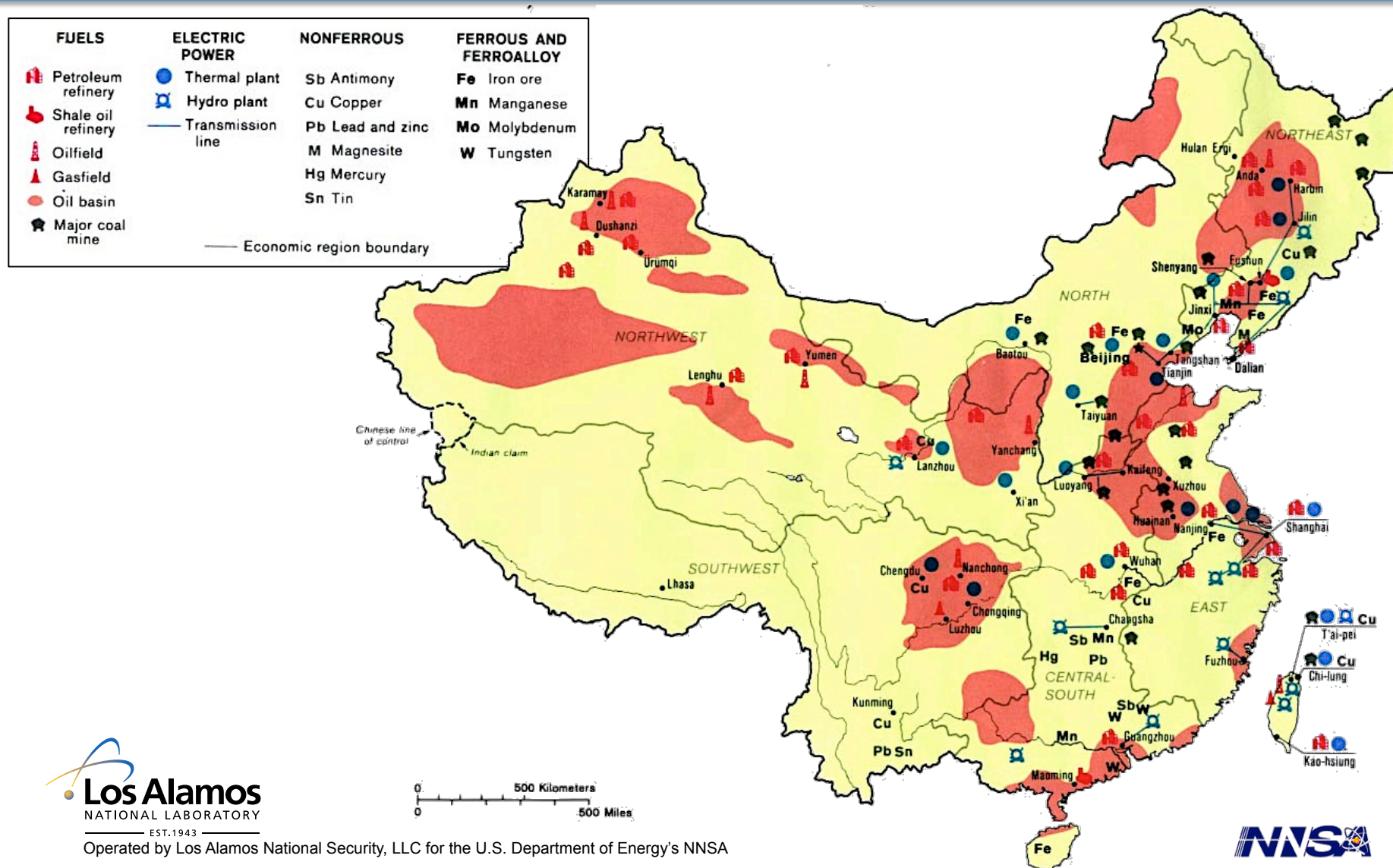
In the mid-1990s, 512 large SOEs were designated as priority companies; the central government has also promoted “bureaucratic-led restructuring” in an effort to make these companies globally competitive

Examples: PetroChina, Sinopec, and China Telecom

PetroChina is now the world's **BIGGEST** company, worth about **\$1 trillion**--more than twice the value of Exxon Mobil



China: Fuels, Power, Minerals, and Metals



Case study: New Element NPhone

